

**Abstract**

## USE OF PHOTONIC BAND GAP STRUCTURES IN OPTICAL AMPLIFIERS

5 An optical amplifier uses a photonic band gap structure  
having a doped core defining at least a first wavelength  
range over which stimulated emission can occur after  
excitation caused by the introduction of pump light. The  
photonic band gap structure is designed to permit light  
10 having energy corresponding to the wavelength range to be  
transmitted only in selected directions, including along  
the photonic band gap structure. The propagation down  
the structure is one of a discrete number of possible  
transmission directions for the photons resulting from  
15 stimulated emission. This improves the pump efficiency,  
as the stimulated emissions are concentrated into the  
direction of propagation down the fiber.

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